Ergonomics at Work

Ergonomics is the science of designing workplaces, equipment, and jobs to fit people. Use this guide to learn how to work safely and to find out what to do if you have an ergonomic problem. Repetitive awkward motions and poorly designed tools and workstations can lead to ergonomic injuries and, if uncorrected, cumulative trauma disorder (CTD). Improved work habits, a reconfigured workstation, and tools that fit you and the job can prevent injury and discomfort.

The Lawrence Livermore National Laboratory ergonomic program is a proactive approach to preventing and managing ergonomic illnesses and injuries. It consists of management and employee training and education as well as worksite evaluations. Education is essential for the development of improved work habits. Early recognition of symptoms with prompt intervention helps prevent more serious or chronic ergonomic problems.

Identification of Ergonomic Risk

Employees at risk for ergonomic injuries generally have several factors in common. They perform highly intensive repetitive motion tasks for long periods of time. They may have adopted work habits that can lead to injury. Their workstations may not be properly designed for them or their tasks. The tools they use may not be correctly designed or the right size.

Some of the resulting symptoms may include pain, stiffness, or numbness in the hands, elbows, shoulders, or neck. Low back pain may be experienced after long periods of sitting in an ergonomically inadequate chair. Headaches, eyestrain, and blurred vision might occur after long periods at the computer. If you experience any of these symptoms, you should tell your supervisor and report to Health Services.

Your area ergonomic evaluator and industrial safety engineer are excellent sources to find out how you can improve your work habits, modify your workstation, and select the right tools.

Computer Workstation Ergonomics

Your work area should be designed to fit you and your work style. Ergonomists agree that no one can maintain one "ideal" posture all day. Therefore, adjustable furniture that can support proper posture in more than one position is desirable. There are four variables for maintaining proper posture: the work surface, the keyboard, the monitor, and the chair. It is important to learn how to set up your workstation correctly. Your supervisor can arrange for an ergonomic evaluation of your workstation. An already published booklet, *Stop Repetitive Motion Injuries*, covers computer workstation setup. Copies are available at the front desk in Health Services.

Ergonomic Injury Prevention Strategies

- Use ergonomically designed tools, equipment, and furniture in a correctly designed workplace.
- Allow tendons and muscles frequent short rest periods from repetitive activities by varying tasks 5 minutes out of every 30 minutes.
- Adopt work habits that avoid awkward, twisting, or static postures; reduce repetitious movements; and use the lowest amount of force to accomplish a task. For example, avoid an excessively tight grip on tools or heavy pressure on computer keys.
- Avoid putting pressure on nerves, tendons, or blood vessels at the base of the palm, the wrist, and the elbow.
- Seek early evaluation of symptoms, e.g., aches, pains, or numbness.

Hand Tool Ergonomics

Certain wrist and hand movements may increase your chances of developing repetitive motion problems. To avoid this, work with well-designed tools, know how to hold and use them, and modify the way you use your wrist and hand to avoid harming muscles, nerves, or joints. If you are not sure if your tools are appropriate for the job, Hazards Control can assist you.

- Avoid tools that produce a bent wrist position. The wrist should be kept straight (neutral) while you work.
- Select tools that fit your hand. A tool that is too large or too small will produce stresses in the hand and wrist. Generally, the ideal handle diameter is 1.5 inches for a man and 1.3 inches for a woman.
- For power or pneumatic tools, select tools with built-in vibration dampening.
- Use a soft covering on a tool handle to reduce pressure points, protect hands from heat and cold, reduce vibration, and improve grip.

Avoiding Eyestrain

Computer work requires you to use your eyes at close distance for long periods of time. This could result in eyestrain, especially for persons who need bifocals. Symptoms of eyestrain include blurred vision, sore eyes, focusing problems, and headaches. Properly corrected vision, regular eye exams, careful computer placement (about an arm's length to the monitor), and proper lighting can reduce eyestrain.

- Use an adjustable copy holder to reduce awkward head movements and to minimize the need to adjust your eyes to different distances.
- Place the monitor to avoid glare from windows and/or major light sources. Glare screens are available and light bulbs can be removed to reduce brightness.
- Wear computer glasses if you work at a computer more than four hours a day and if you need them to alleviate eyestrain. They are available to employees at no cost through Health Services' Safety Glasses Office.

Alternative Work Periods

Persons at highest risk for CTD are employees who engage in continuous, highly intensive repetitive tasks. An alternative work activity that uses different muscles and does not involve repetitive motion should be conducted 5 minutes for every 30 minutes of work. This will allow the muscles and tendons to rest. Computer users should also look at a distant object for a few seconds every 5 to 10 minutes to relax the eye muscles.

More Information

For further information on these topics, contact the following:

- ES&H Team Leader — ES&H concerns or questions
- ES&H Team Safety Engineer — workplace evaluations
- Health Services Department, ext. 2-7459 — medical evaluations
- Safety Training, Hazards Control Department, ext. 2-5158 — training information and registration
- Plant Engineering, ext. 3-7000 — consultation for planning and designing or redesigning work areas
- Risk Management Office, Human Resources, ext. 3-7166 — Workers' Compensation Claims Processing

Employee Training and Education

Education and training are essential for the prevention and correction of ergonomic injuries and illnesses. You should receive sufficient information and training to recognize ergonomic risk factors, to understand the nature of ergonomic injuries and illnesses, and to be aware of potential corrective measures and resources available.

Training is available through the following courses, which are described in the LLNL Course Catalog:

- HS 5300 Back Care Workshop
- HS 5310 Video Display Terminal (VDT) Ergonomics
- HS 5311 Ergonomics — The Selection and Use of Hand Tools
- HS 5312 VDT Ergonomics for the Supervisor/ Evaluator
- HS 5316-W KeyMoves

If you would like to take a course, contact your department training coordinator.

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